

# MSKSEMI 美森科

SEMICONDUCTOR



ESD



TVS



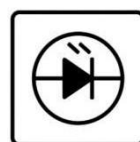
TSS



MOV



GDT



PLED

## 74HC164D(MS)

产品规格手册

## 产品简介

74HC164D(MS) 是一款采用高速 CMOS 工艺技术设计的两线输入的 8 位移位寄存器。寄存器由主从 D 型触发器构成，它具有很高的抗噪性和抗干扰性。在时钟 CLOCK 上升沿到来时 8 位二进制数据 (Qa~Qg) 向右移一位。带有一个清 0 输入端，可以轻松实现输出数据的清零。该移位寄存器也可根据需要实现多级芯片扩展输出。

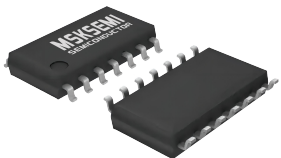
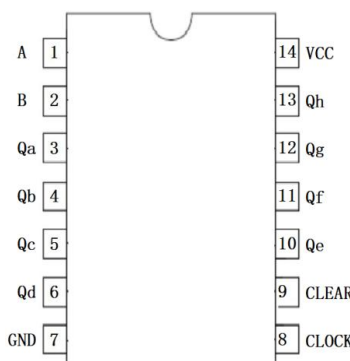
## 产品特点

- 低输入电流：≤1uA
- 传播延迟时间：典型值 20ns
- 低静态功耗：Icc≤5.0μA, @ VCC=6V
- 复合使能输入，可轻松实现多级扩展
- 宽工作电压范围：2.0V to 6.0V
- 封装形式：SOP14

## 产品用途

- 8 位移位寄存器
- 自动化工程控制
- 其它应用领域

## 封装形式和管脚功能定义

封装图	脚位信息
 <p>SOP-14</p>	

管脚序号	管脚定义	功能说明
1	A	数据输入端
2	B	数据输入端
3~6	Qa~Qd	Qa~Qd 数据输出端
7	GND	电源地
8	CLEAR	清 0 端，低电平有效
9	CLOCK	时钟控制端，上升沿有效
10~13	Qe~Qh	Qe~Qh 数据输出端
14	VCC	电源正

## 真值表

Inputs				Outputs			
Clear	Clock	A	B	QA	QB	...	QH
L	X	X	X	L	L		L
H	L	X	X	QA0	QB0		QH0
H	↑	H	H	H	QAn		QGn
H	↑	L	X	L	QAn		QGn
H	↑	X	L	L	QAn		QGn

注：

QA=AB

H 表示高电平；

L 表示低电平；

× 表示任意状态。

↑ 表示上升沿有效

QA0--QH0 表示保持原有状态

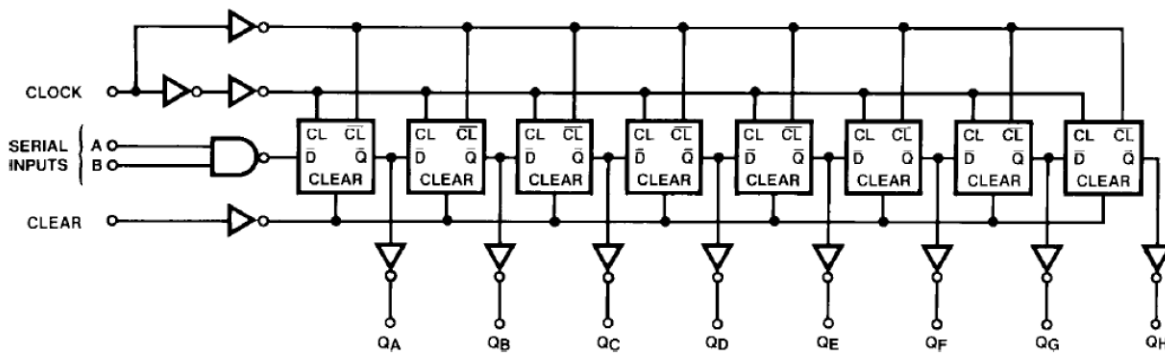
QAn—QGn 表示原有状态向右移位

**极限参数**

参数	符号	极限值	单位
电源电压	$V_{CC}$	-0.5 to 6.5	V
输入/输出电压	$V_{IN}$ 、 $V_{OUT}$	-0.5 to $V_{CC}+0.5$	V
输入/输出钳位电流	$I_{IK}$ 、 $I_{OK}$	$\pm 20$	mA
单个管脚输出电流	$I_{OUT}$	$\pm 25$	mA
单个管脚接 VCC 或 GND 电流	$I_{CC}$	$\pm 50$	mA
耗散功率	$P_D$	500	mW
工作温度	$T_A$	0-70	$^{\circ}C$
存储温度	$T_S$	-65-150	$^{\circ}C$
引脚焊接温度	$T_W$	260, 10s	$^{\circ}C$

注: 极限参数是指无论在任何条件下都不能超过的极限值。一旦超过此极限值, 将有可能造成产品劣化等物理性损伤; 同时在接近极限参数下, 不能保证芯片可以正常工作。

**原理逻辑图**



**工作条件**

项目	符号	最小值	典型值	最大值	单位	
工作电压	$V_{CC}$	2	5	6	V	
输入输出电压	$V_{IN}$ 、 $V_{out}$	0	-	$V_{CC}$	V	
输入上升/ 下降时间	$t_r$ $t_f$	$V_{CC}=2.0V$	0	-	1000	ns
		$V_{CC}=4.5V$	0	-	500	ns
		$V_{CC}=6.0V$	0	-	400	ns

## 电学特性

 直流电学特性:  $T_A=25^{\circ}\text{C}$ 

符号	项目	测试条件		VCC(V)	最小值	典型值	最大值	单位
$V_{IH}$	高电平有效输入电压			2.0	1.5	-	-	V
				4.5	3.15	-	-	V
				6.0	4.2	-	-	V
$V_{IL}$	低电平有效输入电压			2.0	-	-	0.5	V
				4.5	-	-	1.35	V
				6.0	-	-	1.8	V
$V_{OH}$	高电平输出电压	$V_I = V_{IH} \text{ or } V_{IL}$	$I_{OH} = 20\mu\text{A}$	2.0	1.9	-	-	V
				4.5	4.4	-	-	V
			$I_{OH} = 4.0\text{mA}$	4.5	3.9	4.3		V
				6.0	5.2	5.7		V
$V_{OL}$	低电平输出电压	$V_I = V_{IH} \text{ or } V_{IL}$	$I_{OH} = 20\mu\text{A}$	2.0	-	-	0.1	V
				4.5	-	-	0.1	V
			$I_{OH} = 4.0\text{mA}$	4.5	-	0.2	0.5	V
				6.0	-	0.3	0.5	V
$I_{IN}$	输入电流	$V_I = V_{CC} \text{ or } \text{GND}$		6.0	-	-	1	$\mu\text{A}$
$I_{CC}$	工作电流	$V_I = V_{CC} \text{ or } \text{GND}, I_{OUT} = 0\mu\text{A}$		6.0	-	-	5	$\mu\text{A}$
$V_{CC}$	工作电压				2	-	6	V

 交流电学特性:  $T_A=25^{\circ}\text{C}$   $V_{CC}=5.0\text{V}$ ,  $C_L=16\text{pF}$ ,  $t_r=t_f \leq 20\text{ns}$ 。

符号	项目	测试条件	最小值	典型值	最大值	单位
$t_{PHL}$	传输延迟时间	-	-	24	-	ns
$t_{PLH}$	Clock to Output	-	-	18	-	ns
$t_{PHL}$	传输延迟时间	-	-	25	-	ns
$t_{PLH}$	Clear to Output	-	-	17	-	ns
$f_{MAX}$	传输延迟时间	-	-	22	-	ns
$t_{REM}$	最小清除时间 Clear to Clock	-	-	5	-	ns
$t_S$	最小设置时间 Data to Clock	-	-	30	-	ns
$t_H$	最小保持时间 Clock to Data	-	-	10	-	ns
$t_W$	最小脉宽 Clock or Clear	-	-	18	-	ns



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